REPORT ON THE INVESTIGATION OF SUBSURFACE PETROLEUM CONTAMINATION VERMONT ELECTRIC COOPERATIVE JOHNSON, VERMONT

August, 1992

Prepared for:

Vermont Electric Cooperative
Johnson, Vermont

Prepared by:

Griffin International, Inc.
Williston, Vermont

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1.0 INTRODUCTION

This report details the investigation of subsurface petroleum contamination in the vicinity of the Vermont Electric Cooperative (VT COOP.) in Johnson, Vermont. The investigation has been conducted by Griffin International, Inc. (Griffin) for Mr. Dick Simays. The Vermont Department of Environmental Conservation (VTDEC) requested that this investigation be conducted in a letter to Mr. Simays dated June 16, 1992.

The subsurface contamination is suspected to have originated from the underground petroleum storage tank (UST) which was removed from the site on May 28, 1992.

2.0 SITE BACKGROUND

2.1 Site History

On May 28, 1992, Lee's Oil Service of Haverhill, NH removed one gasoline underground storage tank from the VT COOP. Griffin conducted the inspection of the tank removal. During the investigation, Griffin concluded that there had been a release of hydrocarbons at this site. The DEC required that a subsurface investigation be conducted to determine the extent of the contamination and the possible impact to potential receptors.

The COOP. hired Griffin International to conduct the investigation. The investigation began on June 12, 1992, with the collection of water samples from nearby supply wells to determine if the drinking water supplies in the area had been impacted by the contamination. The wells were identified by the VTDEC as potential receptors of the contamination at the COOP. These samples were analyzed for BTEX and MTBE using EPA Method 602.

A trace below quantifiable limits of Xylenes was detected in the Frank Stiles well which is located approximately 2,000 feet northwest of the site. The well was sampled again on August 3, 1992 to confirm these results. The results indicated that there was no detection of BTEX or MTBE in the well. The discrepancy was most likely due to residual petroleum products at the sampling point in the Stiles garage on the first sampling date. The first sample was collected from the end of a garden hose in the garage which may have been contaminated with gasoline stored in the garage. The second sample was collected from the faucet in the kitchen sink.

All other results from the supply wells indicated no detection of any BTEX or MTBE.

The Wescom supply well, which serves the Wescom Mobile Home Park, was also analyzed for volatile organic compounds (VOCs) on January 30, 1992 to comply with the State of Vermont Department of Health requirements for public supply wells. No VOCs were detected at this time. Construction details of the nearby supply wells are contained in Griffin's work plan and supply well results dated July 6, 1992.

The investigation continued on July 24, 1992 with the installation of two monitoring wells. Two more monitoring wells were installed on July 27, 1992. The wells were installed to determine the extent of the subsurface contamination from the suspect UST and to define the direction of the groundwater flow beneath the site.

According to Mr. Simay's, of the COOP, the suspect UST was located at the southwest corner of the building until 1974. At that time, the tank was moved to the vicinity of the pump island. Releases from this tank or associated piping while it was at the southwest corner of the building may account for the presence of subsurface petroleum contamination upgradient of the most recent location of the tank.

2.2 Site Description

The Vermont Electric Cooperative is located on Route 15 just outside of downtown Johnson, Vermont (see site location map, Appendix A). The area is mostly residential with the Wescom Mobile Home Park located south of the site, some homes located west of the site, and a gas station/store located just east of the site. The southern section of the mobile home park and several residences to the west of the COOP are served by private water supply wells. The northern section of the mobile home park and the convenience store located east of the COOP are served by the municpal water system.

According to the Surficial Geologic Map of Vermont and the Centennial Geologic Map of Vermont, the overburden in the area is predominantly littoral and alluvial sediments overlaying quartz schist.

The potential receptors of the contamination include the Lamoille River which is located approximately 2000 feet south of the site, a swampy area located behind the site, and the drinking water supply wells downgradient from the tank pit area.

3.0 INVESTIGATIVE PROCEDURES

3.1 Monitoring Well Installation

On July 24 and July 27, 1992 four groundwater monitoring wells were installed to determine the extent of subsurface contamination in the vicinity of the Vermont Electric Cooperative. Two wells were installed on July 24, 1992, and two wells were installed on July 27, 1992. The locations of the wells are shown on the Site Map in Appendix A.

The wells were installed using a hollow stem auger drill rig, under the supervision of a Griffin hydrogeologist. All four monitoring wells were drilled to a depth of 32 feet below grade. Undisturbed soil samples were retrieved using a split spoon sampler at five foot intervals during the drilling. The soil samples were screened for hydrocarbon vapors using a portable photoionization device (PID).

The vapor concentrations and soil characteristics are indicated on the well logs in Appendix B.

The wells were constructed with ten feet of 2" diameter well screen. Each well was constructed with 22 feet of well casing above the well screen. In each well, the annulus between the borehole wall and the well screen was packed with silica sand to prevent infiltration of silts into the well. In MW-1, MW-2 and MW-3, native backfill was used to fill the remainder of the annulus to a depth of three feet below grade. MW-4 had native fill up to fifteen feet below grade. Two feet of bentonite was placed at 12-15 feet to prevent the possible infiltration of perched water into the groundwater in the well. Native fill was placed above the bentonite to three feet below grade. In each well, one foot of bentonite pellets was placed above the native fill to prevent surface water infiltration into the groundwater in the wells. Each well was completed with some native fill above the bentonite and an eight inch diameter, bolt-down well cover which was surrounded by concrete.

MW-1 was installed to establish an upgradient data point from the contaminated tank pit area. The well was installed approximately twenty feet north of the pump island. Soils retrieved from this well consisted mostly of fine silts and sands with coarse sand and gravel with some rock fragments. Concentrations of hydrocarbon vapors were detected up to 300 parts per million (ppm) in the soils just above the water table. Soils sampled from the bottom of the borehole had PID readings up to 80 ppm.

MW-2 was installed approximately thirty feet downgradient of the pump island. Soils retrieved from this well consisted mostly of fine silts and sands with some gravel and rock fragments. Concentrations of hydrocarbon vapors were detected up to 7 ppm in the soils at the bottom of the borehole.

MW-3 was installed in the center of the tank pit area to determine the degree of the contamination where the suspect UST was located. Soils retrieved from this well consisted mostly of medium to coarse sand and gravel with some layers of sandy silt and some rock fragments. Concentrations of hydrocarbon vapors were detected up to 2 ppm in the soils at the bottom of the borehole.

MW-4 was installed approximately fifty feet downgradient from the pump island. Soils retrieved from this well consisted mostly of sand and gravel with some layers of sandy silt and silty sand with some gravel. Hydrocarbon vapor concentrations in this borehole were detected up to 20 ppm just below the water table.

3.2 Determination of Groundwater Gradient and Flow Direction

The water table elevations in each monitoring well were measured on August 3, 1992. The elevations were measured relative to a benchmark (MW-1) which was assigned an

arbitrary elevation of 100 feet. The water table elevations in each well are indicated in feet on the Groundwater Contour Map in Appendix A. Water table contours were constructed on the map by using the water table elevations at each well. There is a 5.67' difference in the water table elevations in MW-1 and MW-3. The map indicates that groundwater in the vicinity of the Vermont Electric COOP flows south, toward the Lamoille River, at a 7% gradient.

3.3 Groundwater Sampling and Analysis

On August 3, 1992, Griffin collected groundwater samples from each on site monitoring well for laboratory analysis for BTEX and MTBE using EPA Method 602. Samples were collected after approximately three well volumes from each each well were evacuated using a clean two foot, teflon bailer. Results of the analyses are presented in Appendix C.

The results indicate that the upgradient well (MW-1) was the most contaminated with concentrations of Toluene at 21,000 part per billion (ppb) and Xylenes at 18,600 ppb. The presence of significant contamination concentrations in this area may be due to releases of product from the suspect UST when it was located at the southwest corner of the COOP building, prior to 1974. This assumption is supported by the relative lack of MTBE in the sample collected from this well. MTBE was not commercially introduced into gasoline until 1979.

MW-4, which was placed in the center of the suspect UST area, and MW-2, which is approximately twenty feet downgradient of MW-4, contained significant concentrations of BTEX. Results from MW-4 indicate higher concentrations of MTBE than in MW-2 or MW-1.

MW-3 contained higher concentrations of MTBE than were detected in MW-1 or MW-2, but much lower concentrations than in MW-4. BTEX concentrations in MW-3 were not as high as in the other wells.

The water supply well results indicate that no contaminants were detected as of August 3, 1992.

The Contamination Distribution Map in Appendix A illustrates the assumed combined concentrations of BTEX and MTBE in parts per billion in groundwater at this site.

4.0 CONCLUSIONS

After a thorough review of the above findings, Griffin International has come to the following conclusions concerning the subsurface petroleum contamination at the Vermont Electric Cooperative.

1. There was a release of petroleum products in the vicinity of the tank pit where the suspect UST was removed. The amount and duration of the release are unknown. The likely source of the release, a former gasoline UST, has been removed.

2. The release has resulted in contamination of soils (adsorbed) and groundwater (dissolved) beneath the site. The contamination downgradient of the most recent location of the suspect UST is known to contain benzene, ethylbenzene, toluene, xylenes and MTBE, which are commonly present in gasoline products. Contamination upgradient of the most recent location of the suspect UST may be due to releases from the tank or associated piping while it was in that location.

3. The soils at this site consist mostly of sands and gravel with some silts and rock fragments. These soils likely possess relatively high permeability which results in relatively rapid migration of the groundwater and dissolved contamination.

4. The groundwater beneath the tank pit area flows south at a 7% gradient towards the Lamoille River. This steep gradient is another indication of high rates of groundwater flow in the overburden.

5. Potential receptors of the contamination include supply wells downgradient of the COOP, the Lamoille River, and the swampy area behind the site.

6. To date, the supply wells in the area have not been impacted by the contamination.

5.0 RECOMMENDATIONS

Based on the above conclusions, Griffin International presents the following recommendations concerning subsurface petroleum contamination at the Vermont Electric Cooperative:

1. To determine if the contamination plume has migrated towards the trailer park area, the swamp behind the site should be investigated for petroleum contamination. This may be conducted through hand augering and installing sampling points. Water and soil samples should be collected from the swamp and analyzed for BTEX and MTBE using EPA Method 602.

2. If contamination is found in the swamp, at least one groundwater monitoring well should be installed in the field between the swamp and the trailer park area to identify the edge of the plume.

3. To determine the upgradient edge of the contamination plume, at least one more groundwater monitoring well should be installed between MW-1 and the COOP. supply well.

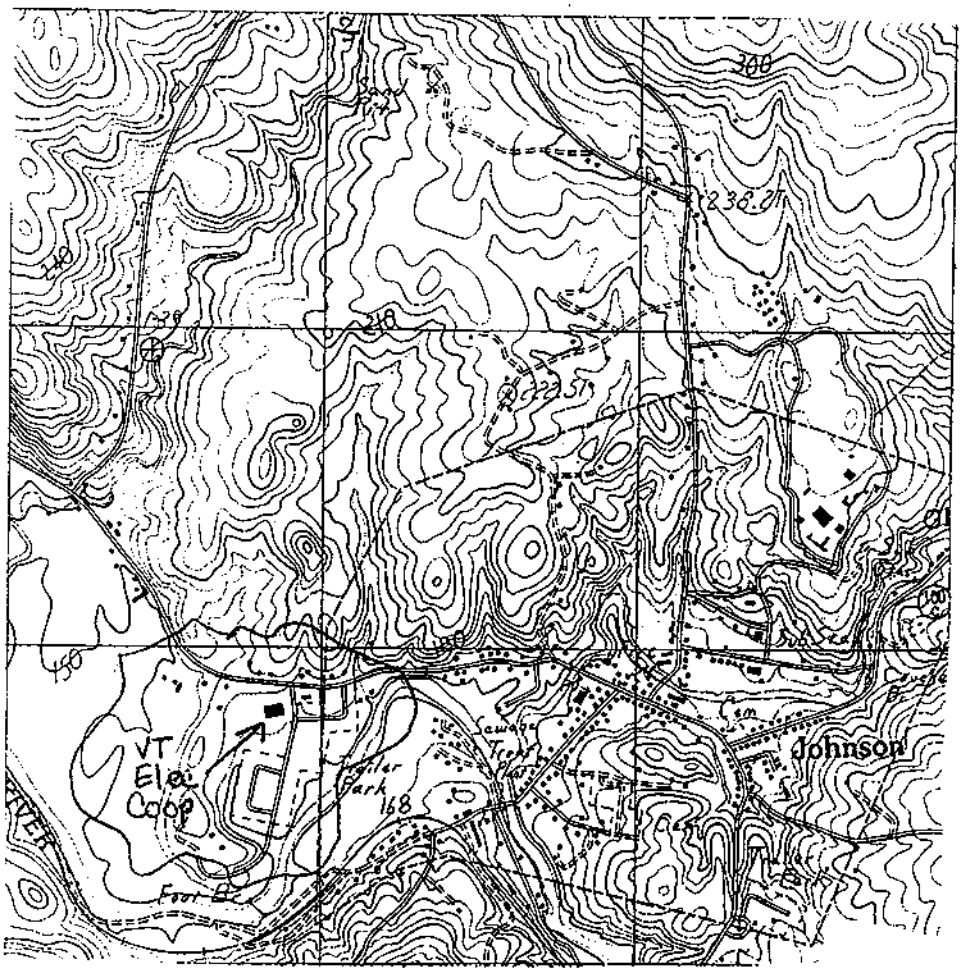
4. Due to the degree of the petroleum contamination, Griffin recommends regular sampling and laboratory analysis of groundwater in on-site monitoring wells. These samples should be analyzed for BTEX and MTBE using EPA Method 602.

5. The Wescom Mobil Home Park supply wells (primary and backup), which are located downgradient of the site, should be sampled again and analyzed for BTEX and MTBE using EPA Method 602.

APPENDIX A

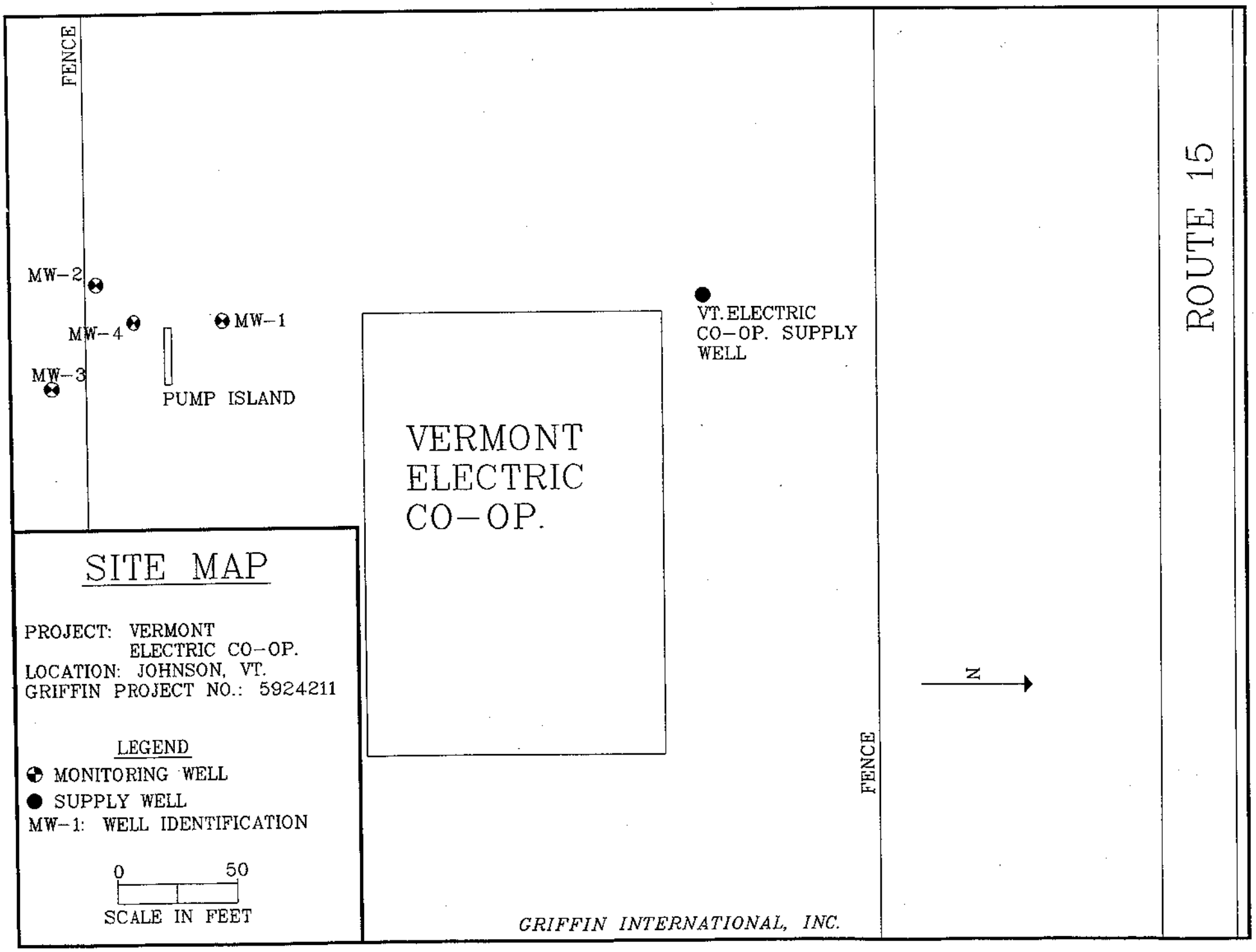
Site Maps

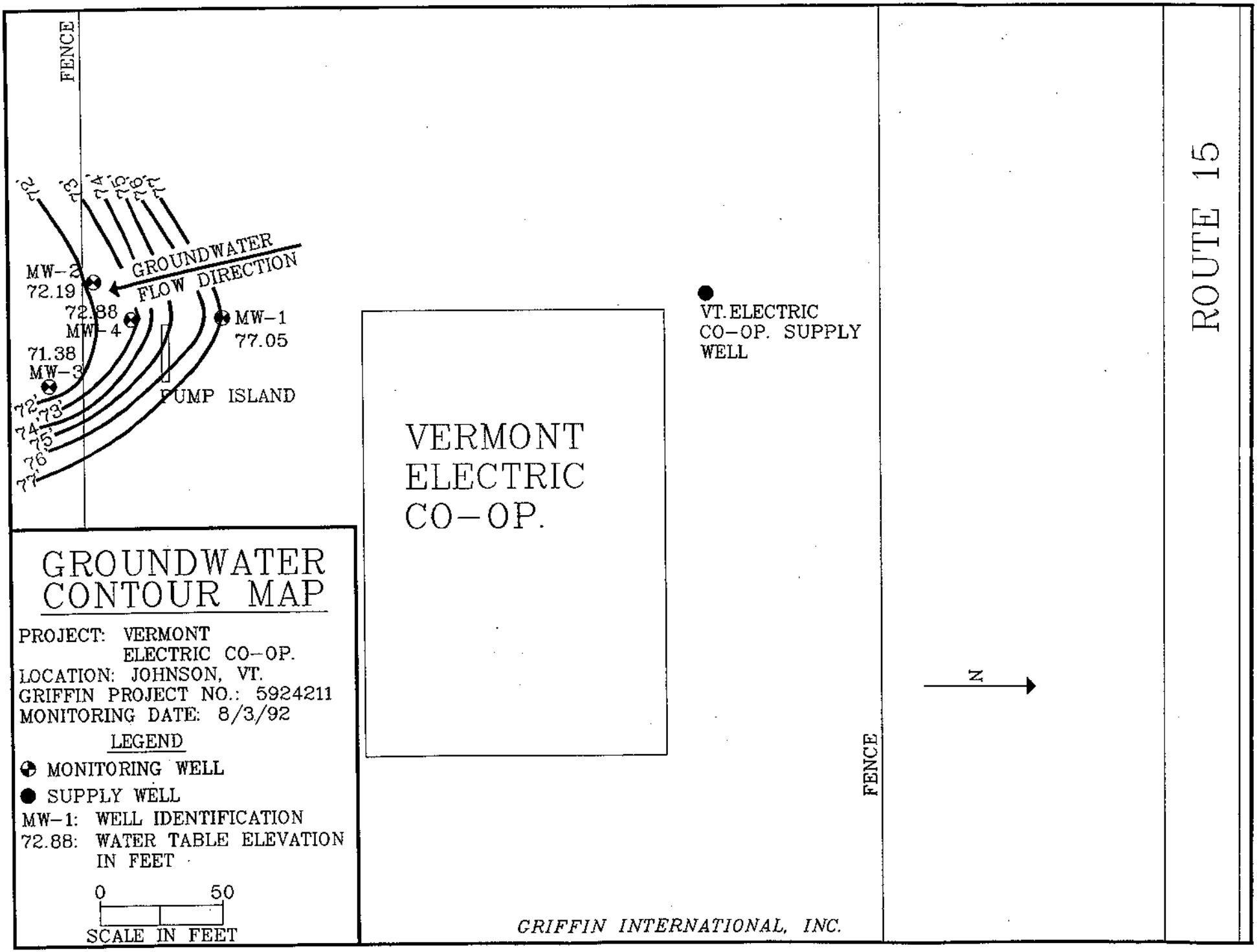
SITE LOCATION MAP
VERMONT ELECTRIC COOPERATIVE
ROUTE 15
JOHNSON, VERMONT

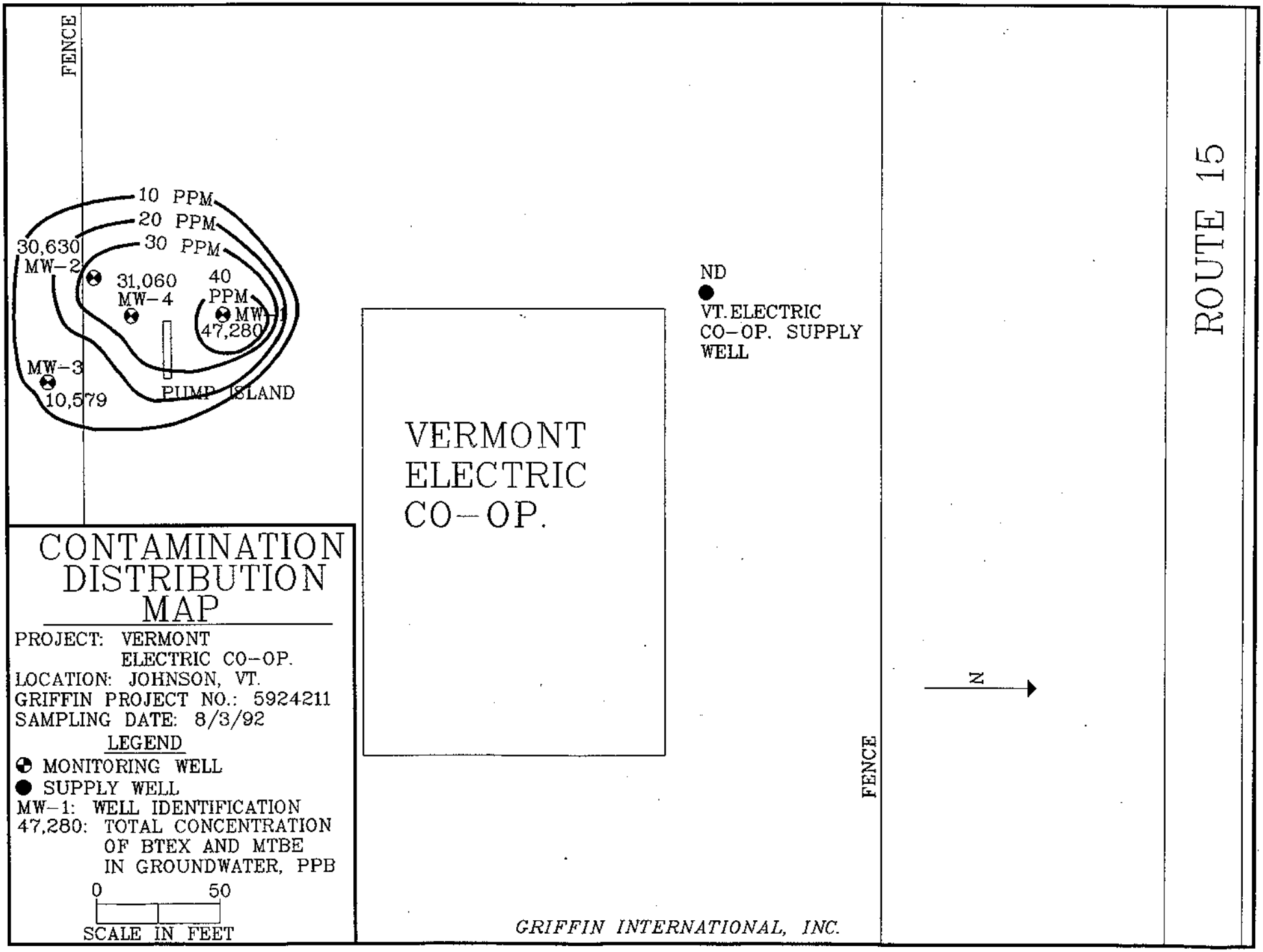


921235

SOURCE:
USGS JOHNSON, VT. QUADRANGLE
SCALE 1:24,000
PROVISIONAL EDITION 1986


FENCE
MW-2
MW-4
MW-1
MW-3
PUMP ISLAND
VERMONT ELECTRIC CO-OP.
VT. ELECTRIC CO-OP. SUPPLY WELL
ROUTE 15
FENCE
N
SITE MAP
PROJECT: VERMONT ELECTRIC CO-OP.
LOCATION: JOHNSON, VT.
GRIFFIN PROJECT NO.: 5924211
LEGEND
MONITORING WELL
SUPPLY WELL
MW-1: WELL IDENTIFICATION
0
50
SCALE IN FEET
GRIFFIN INTERNATIONAL, INC.


FENCE
72'
73'
74'
75'
76'
77'
GROUNDWATER
FLOW DIRECTION
MW-2
72.19
72.88
MW-4
MW-1
77.05
71.38
MW-3
PUMP ISLAND
VERMONT
ELECTRIC
CO-OP.
VT. ELECTRIC
CO-OP. SUPPLY
WELL
FENCE
ROUTE 15
N
GROUNDWATER
CONTOUR MAP
PROJECT: VERMONT
ELECTRIC CO-OP.
LOCATION: JOHNSON, VT.
GRIFFIN PROJECT NO.: 5924211
MONITORING DATE: 8/3/92
LEGEND
MONITORING WELL
SUPPLY WELL
MW-1: WELL IDENTIFICATION
72.88: WATER TABLE ELEVATION
IN FEET
0
50
SCALE IN FEET
GRIFFIN INTERNATIONAL, INC.


FENCE
10 PPM
20 PPM
30 PPM
30,630
MW-2
31,060
MW-4
40
PPM
MW-1
47,280
MW-3
10,579
PUMP ISLAND
VERMONT
ELECTRIC
CO-OP.
ND
VT. ELECTRIC
CO-OP. SUPPLY
WELL
FENCE
ROUTE 15
N
CONTAMINATION
DISTRIBUTION
MAP
PROJECT: VERMONT
ELECTRIC CO-OP.
LOCATION: JOHNSON, VT.
GRIFFIN PROJECT NO.: 5924211
SAMPLING DATE: 8/3/92
LEGEND
MONITORING WELL
SUPPLY WELL
MW-1: WELL IDENTIFICATION
47,280: TOTAL CONCENTRATION
OF BTEX AND MTBE
IN GROUNDWATER, PPB
0
50
SCALE IN FEET
GRIFFIN INTERNATIONAL, INC.

APPENDIX B

Well Logs

PROJECT VERMONT ELECTRIC CO-OP.

LOCATION JOHNSON, VERMONT

DATE DRILLED 7/24/92 TOTAL DEPTH OF HOLE 32'

DIAMETER 6"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"

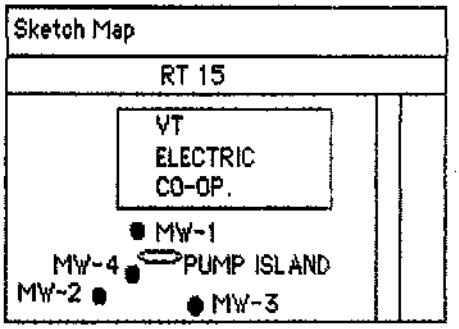
CASING DIA. 2" LENGTH 22' TYPE PVC

DRILLING CO. GREEN MT. BORING DRILLING METHOD HOLLOW STEM AUGER

DRILLER RON GARNEAU LOG BY PAMELA D'ANDREA

WELL NUMBER MW-1

Sketch Map



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX		
2		WELL CAP		Dry, loose, brown fine-medium SAND and GRAVEL
4		CONCRETE		
6		NATIVE FILL		Damp, medium dense, brown/gray fine SILT, some sand and gravel
8		BENTONITE	5'-7': 10,12,11,9 2 PPM	No petroleum odor
10		RISER		
12		NATIVE FILL	10'-12': 5,5,4,7 20 PPM	Dry, medium dense, brown, fine-medium SAND, trace silt Strong petroleum odor
14				
16			15'-17': 21,14,8,8 300 PPM	Moist, coarse SAND and GRAVEL, some pebbles and quartz rock fragments Strong petroleum odor
18				
20			20'-22': 27,43,28,34 200 PPM	Moist, brown, fine silty SAND, some pebbles and quartz rock fragments Petroleum odor
22				WATER TABLE ▼
24				
26		SAND PACK	25'-27': 42,53,41,9 150 PPM	Wet, brown, fine silty SAND into sandy SILT with rock fragments, petroleum odor
28		WELL SCREEN		
30			30'-32': 22,20,30,31 80 PPM	Wet, brown, medium SAND and GRAVEL into schist rock fragments, with brown, fine silty SAND at 31.75', petroleum odor
32		BOTTOM CAP		
34				BASE OF EXPLORATION AT 32'
36				
38				
40				
42				
44				
46				
48				
50				
52				

Griffin International

REF:PAINT 67

PROJECT VERMONT ELECTRIC CO-OP.

LOCATION JOHNSON, VERMONT

DATE DRILLED 7/24/92 TOTAL DEPTH OF HOLE 32'

DIAMETER 6"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"

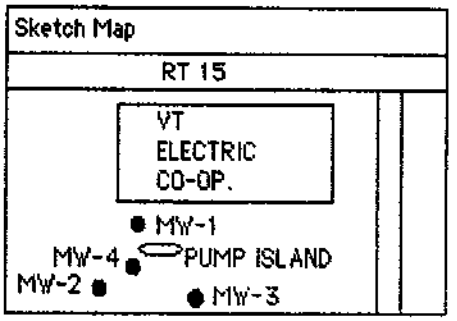
CASING DIA. 2" LENGTH 22' TYPE PVC

DRILLING CO. GREEN MT. BORING DRILLING METHOD HOLLOW STEM AUGER

DRILLER RON GARNEAU LOG BY PAMELA DEANDREA

WELL NUMBER MW-2

Sketch Map



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX		
0		WELL CAP		
0		CONCRETE		
2		NATIVE FILL		
4		BENTONITE		Dry, medium dense, brown, fine-medium silty SAND, some gravel and small rock fragments Slight petroleum odor
6		RISER	5'-7': 2,3,4,4 1.5 PPM	
8				Dry, dense, brown, medium silty SAND and GRAVEL into damp, loose, medium-coarse SAND and GRAVEL, some rock fragments No odor
10			10'-12': 11,10,12, 15	
12		NATIVE FILL	2 PPM	PERCHED WATER TABLE ▼
14				
16			15'-17': 24,18,14, 15	Dry, dense, brown, fine silty SAND, some gravel and rock fragments, till Slight petroleum odor
18			1.5 PPM	
20			20'-22': 20,14,13, 12	Same as above, no odor
22			2 PPM	
24				WATER TABLE ▼
26		SAND PACK	25'-27': 9,5,5,6 5 PPM	Moist, dense, gray and brown, fine silty SAND, some medium gravel and rock fragments into wet, dense, brown, sandy SILT, slight odor
28		WELL SCREEN		
30			30'-32': 11,6,6,8 7 PPM	Wet, dense, brown, fine silty SAND Slight petroleum odor
32		BOTTOM CAP		BASE OF EXPLORATION AT 32'
34				
36				
38				
40				
42				
44				
46				
48				
50				
52				

Griffin International

REF:PAINT68

PROJECT VERMONT ELECTRIC CO-OP.

LOCATION JOHNSON, VERMONT

DATE DRILLED 7/27/92 TOTAL DEPTH OF HOLE 32'

DIAMETER 6"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"

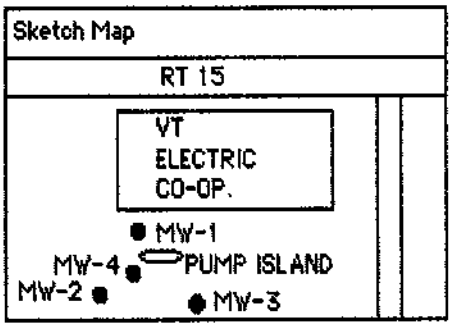
CASING DIA. 2" LENGTH 22' TYPE PVC

DRILLING CO. GREEN MT. BORING DRILLING METHOD HOLLOW STEM AUGER

DRILLER PHIL MANNING LOG BY PAMELA DEANDREA

WELL NUMBER MW-3

Sketch Map



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX, WELL CAP, CONCRETE		
2		NATIVE FILL		Topsoil, some organics
4		BENTONITE	5'-7': 5,3,2,4 0.2 PPM	Dry, loose, brown, fine silty SAND No petroleum odor
6		RISER		
8				Damp, loose, brown, medium-coarse SAND and GRAVEL, some pebbles No petroleum odor
10			10'-12': 4,4,4,8 1 PPM	
12		NATIVE FILL		
14				Dry, medium dense, brown, fine-medium silty SAND and GRAVEL into dry, loose, brown, medium-coarse SAND and GRAVEL, some pebbles and quartz rock fragments, till at 16.5' dry, dense, brown, fine silty SAND No petroleum odor
16			15'-17': 21,15,13,9 0.6 PPM	
18				
20				
22			20'-22': 22,11,11, 12 0.2 PPM	Damp, dense, brown, medium-coarse silty SAND and GRAVEL, some quartz rock fragments into dry, med. dense, brown, very fine SAND, trace silt, no odor WATER TABLE ▼
24				
26		SAND PACK	25'-27': 20,6,6,6 0.2 PPM	
28		WELL SCREEN		Wet, dense, brown, silty SAND and GRAVEL, some pebbles into wet, dense, brown fine sandy SILT No odor
30				
32		BOTTOM CAP	30'-32': 9,6,4,6 2 PPM	Wet, dense, brown, very fine sandy SILT No odor
34				BASE OF EXPLORATION AT 32'
36				
38				
40				
42				
44				
46				
48				
50				
52				

Griffin International

REF:PAINT 68

PROJECT VERMONT ELECTRIC CO-OP.

LOCATION JOHNSON, VERMONT

DATE DRILLED 7/27/92 TOTAL DEPTH OF HOLE 32'

DIAMETER 6"

SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"

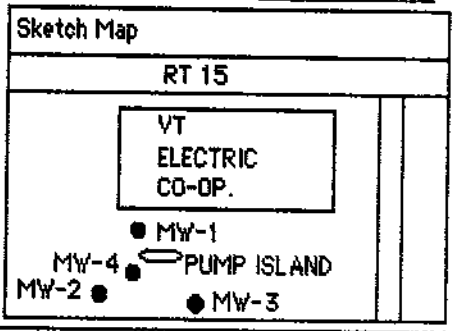
CASING DIA. 2" LENGTH 22' TYPE PVC

DRILLING CO. GREEN MT. BORING DRILLING METHOD HOLLOW STEM AUGER

DRILLER PHIL MANNING LOG BY PAMELA DEANDREA

WELL NUMBER MW-4

Sketch Map



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX		
		WELL CAP		
2		CONCRETE		Dry, loose GRAVEL, fill
		NATIVE FILL		
4		BENTONITE		
6		RISER	5'-7': 4,1,2,1 30 PPM	Dry, loose, brown, fine-medium SAND and GRAVEL, some silt
8				Moist, dense, brown, medium silty SAND and GRAVEL, some rock fragments Petroleum odor
10				
12		NATIVE FILL	10'-12': 8,6,8,7 1 PPM	Damp, loose, brown, medium-coarse SAND and GRAVEL, slight petroleum odor
14		BENTONITE		
16			15'-17': 29,17,18, 16 0 PPM	Dry, dense, gray sandy SILT, some gravel and pebbles into dry, loose, brown & gray, medium-coarse SAND and GRAVEL with mica schist and quartz rock fragments, no odor
18		NATIVE FILL		
20				
22			20'-22': 43,20,11,7 7 PPM	Dry, loose, brown, medium-coarse SAND and GRAVEL with quartz rock fragments into moist, dense, brown, fine sandy SILT, some gravel silty CLAY on bottom WATER TABLE ▼
24				
26		SAND PACK	25'-27': 30,18,10,9 20 PPM	slight petroleum odor
28		WELL SCREEN		Wet, dense, brown/gray, fine sandy SILT, little gravel, slight petroleum odor
30				
32		BOTTOM CAP	30'-32': 6,13,15,23 13 PPM	Wet, dense, brown/gray, fine sandy SILT, some gravel, few pebbles, slight petroleum odor
34				BASE OF EXPLORATION AT 32'
36				
38				
40				
42				
44				
46				
48				
50				
52				

Griffin International

REF:PAINT 69

APPENDIX C

Laboratory Results

GROUNDWATER SAMPLE RESULTS

8/3/92

Parameter	MW-1	MW-2	MW-3	MW-4
Benzene	**4,590**	**6,030**	**1,290**	**5,110**
Chlorobenzene	ND*	ND	ND	ND
1,2 DCB	ND	ND	ND	ND
1,3 DCB	ND	ND	ND	ND
1,4 DCB	ND	ND	ND	ND
Ethylbenzene	**3,090**	**2,800**	**877**	**2,160**
Toluene	**21,000**	**10,900**	**4,040**	**13,500**
Xylenes	**18,600**	**10,900**	**3,800**	**8,060**
Total BTEX	**47,280**	**30,630**	**10,007**	**28,830**
MTBE	TBQ*	TBQ	**572**	**2,230**

*All values reported in ug/L (ppb)
*ND - None Detected
*TBQ - Trace below quantitation limits

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: VT. Electric COOP
REPORT DATE: August 17, 1992
SAMPLER: Becca Schuyler
DATE SAMPLED: August 3, 1992
DATE RECEIVED: August 3, 1992

PROJECT CODE: GIVE1847
ANALYSIS DATE: August 17, 1992
STATION: Trip Blank
REF.#: 33,911
TIME SAMPLED: 7:15

Parameter	Minimum Detection Limit	Concentration (ug/L)
Benzene	1.	ND[1]
Chlorobenzene	2.	ND
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	ND
Xylenes	1.	ND
MTBE	1.	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

Reviewed by

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Vermont Electric COOP
REPORT DATE: August 17, 1992
DATE SAMPLED: August 3, 1992
DATE RECEIVED: August 3, 1992
ANALYSIS DATE: August 14, 1992

PROJECT CODE: GIVE1846
REF.#: 33,908
STATION: Equipment Blank
TIME SAMPLED: 10:15
SAMPLER: Pam DeAndrea

Parameter	Detection Limit (ug/L)	Concentration (ug/L)
Benzene	1	ND[1]
Chlorobenzene	2	ND
1,2-Dichlorobenzene	2	ND
1,3-Dichlorobenzene	2	ND
1,4-Dichlorobenzene	2	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	5	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:
1 None detected

Reviewed by

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Vermont Electric COOP
REPORT DATE: August 17, 1992
DATE SAMPLED: August 3, 1992
DATE RECEIVED: August 3, 1992
ANALYSIS DATE: August 14, 1992

PROJECT CODE: GIVE1846
REF.#: 33,909
STATION: MW 1
TIME SAMPLED: 10:45
SAMPLER: Pam DeAndrea

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	1000	4,590.
Chlorobenzene	2000	ND[2]
1,2-Dichlorobenzene	2000	ND
1,3-Dichlorobenzene	2000	ND
1,4-Dichlorobenzene	2000	ND
Ethylbenzene	1000	3,090.
Toluene	1000	21,000.
Xylenes	1000	18,600.
MTBE	5000	TBQ[3]

NUMBER OF UNIDENTIFIED PEAKS FOUND: 3

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 0.1% dilution.

2 None detected

3 Trace below quantitation limit

Reviewed by

ENDYNE, INC.

Laboratory Services

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Vermont Electric COOP
REPORT DATE: August 17, 1992
DATE SAMPLED: August 3, 1992
DATE RECEIVED: August 3, 1992
ANALYSIS DATE: August 14, 1992

PROJECT CODE: GIVE1846
REF.#: 33,910
STATION: Duplicate (mw-1)
TIME SAMPLED: 10:48
SAMPLER: Pam DeAndrea

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	1000	4,340.
Chlorobenzene	2000	ND[2]
1,2-Dichlorobenzene	2000	ND
1,3-Dichlorobenzene	2000	ND
1,4-Dichlorobenzene	2000	ND
Ethylbenzene	1000	2,860.
Toluene	1000	19,600.
Xylenes	1000	16,900.
MTBE	5000	TBQ[3]

NUMBER OF UNIDENTIFIED PEAKS FOUND: 2

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 0.1% dilution.

2 None detected

3 Trace below quantitation limit

Reviewed by Susan Hubbard

ENDYNE, INC.

Laboratory Services

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Vermont Electric COOP
REPORT DATE: August 17, 1992
DATE SAMPLED: August 3, 1992
DATE RECEIVED: August 3, 1992
ANALYSIS DATE: August 14, 1992

PROJECT CODE: GIVE1846
REF.#: 33,907
STATION: MW 2
TIME SAMPLED: 10:05
SAMPLER: Pam DeAndrea

Parameter	Detection Limit (ug/L)[1]	Concentration (ug/L)
Benzene	1000	6,030.
Chlorobenzene	2000	ND[2]
1,2-Dichlorobenzene	2000	ND
1,3-Dichlorobenzene	2000	ND
1,4-Dichlorobenzene	2000	ND
Ethylbenzene	1000	2,800.
Toluene	1000	10,900.
Xylenes	1000	10,900.
MTBE	5000	TBQ[3]

NUMBER OF UNIDENTIFIED PEAKS FOUND: 2

NOTES:

1 Detection limit raised due to high levels of contaminants. Sample run at 0.1% dilution.

2 None detected

3 Trace below quantitation limit

RECEIVED AUG 19 1992

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: VT. Electric COOP
REPORT DATE: August 17, 1992
SAMPLER: Becca Schuyler
DATE SAMPLED: August 3, 1992
DATE RECEIVED: August 3, 1992

PROJECT CODE: GIVE1847
ANALYSIS DATE: August 17, 1992
STATION: MW-3
REF.#: 33,913
TIME SAMPLED: 9:55

Parameter	Minimum Detection Limit	Concentration (ug/L)
Benzene	100.	1,290.
Chlorobenzene	200.	ND[1]
1,2-Dichlorobenzene	200.	ND
1,3-Dichlorobenzene	200.	ND
1,4-Dichlorobenzene	200.	ND
Ethylbenzene	100.	877.
Toluene	100.	4,040.
Xylenes	100.	3,800.
MTBE	100.	572.

NUMBER OF UNIDENTIFIED PEAKS FOUND: 7

NOTES:

1 None detected
2 Detection limit raised due to high levels of contaminants. Sample run at 1% dilution.

Reviewed by _____

ENDYNE, INC.

Laboratory Services

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(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: VT. Electric COOP
REPORT DATE: August 17, 1992
SAMPLER: Becca Schuyler
DATE SAMPLED: August 3, 1992
DATE RECEIVED: August 3, 1992

PROJECT CODE: GIVE1847
ANALYSIS DATE: August 17, 1992
STATION: MW-4
REF.#: 33,914
TIME SAMPLED: 10:25

Parameter	Minimum Detection Limit[2]	Concentration (ug/L)
Benzene	1,000.	5,110.
Chlorobenzene	2,000.	ND[1]
1,2-Dichlorobenzene	2,000.	ND
1,3-Dichlorobenzene	2,000.	ND
1,4-Dichlorobenzene	2,000.	ND
Ethylbenzene	1,000.	2,160.
Toluene	1,000.	13,500.
Xylenes	1,000.	8,060.
MTBE	1,000.	2,230.

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

1 None detected
2 Detection limit raised due to high levels of contaminants. Sample run at 0.1% dilution.

Reviewed by _____

APPENDIX D

Liquid Level Data

Vermont Electric Cooperative
Liquid Level Monitoring Data
8/3/92

Well I.D.	Well Depth	Top of Casing Elevation	Depth To Product	Depth To Water	Product Thickness	Specific Gravity Of Product	Hydro Eqiuvalent	Corrected Depth To Water	Corrected Water Table Elevation
MW-1	-	**100.00**	-	**22.95**	-	-	-	-	**77.05**
MW-2	-	**98.71**	-	**26.52**	-	-	-	-	**72.19**
MW-3	-	**98.06**	-	**26.68**	-	-	-	-	**71.38**
MW-4	-	**99.19**	-	**26.31**	-	-	-	-	**72.88**

All measurements reported in feet